STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

August 17, 1998

Mr. Matt Hoagland, Chief
US EPA New England
RCRA Corrective Action Section
JFK Building
Boston, MA 02203

RDMS DocID 00100831

RE: MacDermid Environmental Indicator Report

Dear Mr. Hoagland:

The Connecticut Department of Environmental Protection (CTDEP), for the FY 1998 grant, committed to perform Environmental Indicator Reviews at eight (8) high priority (NCAPS) sites and notify EPA in writing whether each site did or did not achieve the Human Exposures Controlled and Groundwater Releases Controlled Environmental Indicators. The fifth Environmental Indicator Review Report has been completed and is enclosed for your review. If you have any questions or comments on the report please call Marina Crawford at (860)424-3574. Thank you.

Sincerely,

David A. Nash,
Director
Waste Engineering and
Enforcement Division
Bureau of Waste Management

DAN:GD:AMC

cc: Chuck Franks, EPA
David Lim, EPA

MACDERMID, INC.
526 HUNTINGDON AVE.,
WATERBURY, CT 06708
EPA I.D. NO CTD001164599
ENVIRONMENTAL INDICATORS REVIEW

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Prepared for:
U.S. Environmental Protection Agency
Region I

REVIEW PREPARED BY: MARINA CRAWFORD

DATE: JULY 25, 1998

MACDERMID, INC.
526 HUNTINGDON AVE., WATERBURY, CT
EPA I.D. NO. CTD001164599

I. INTRODUCTION

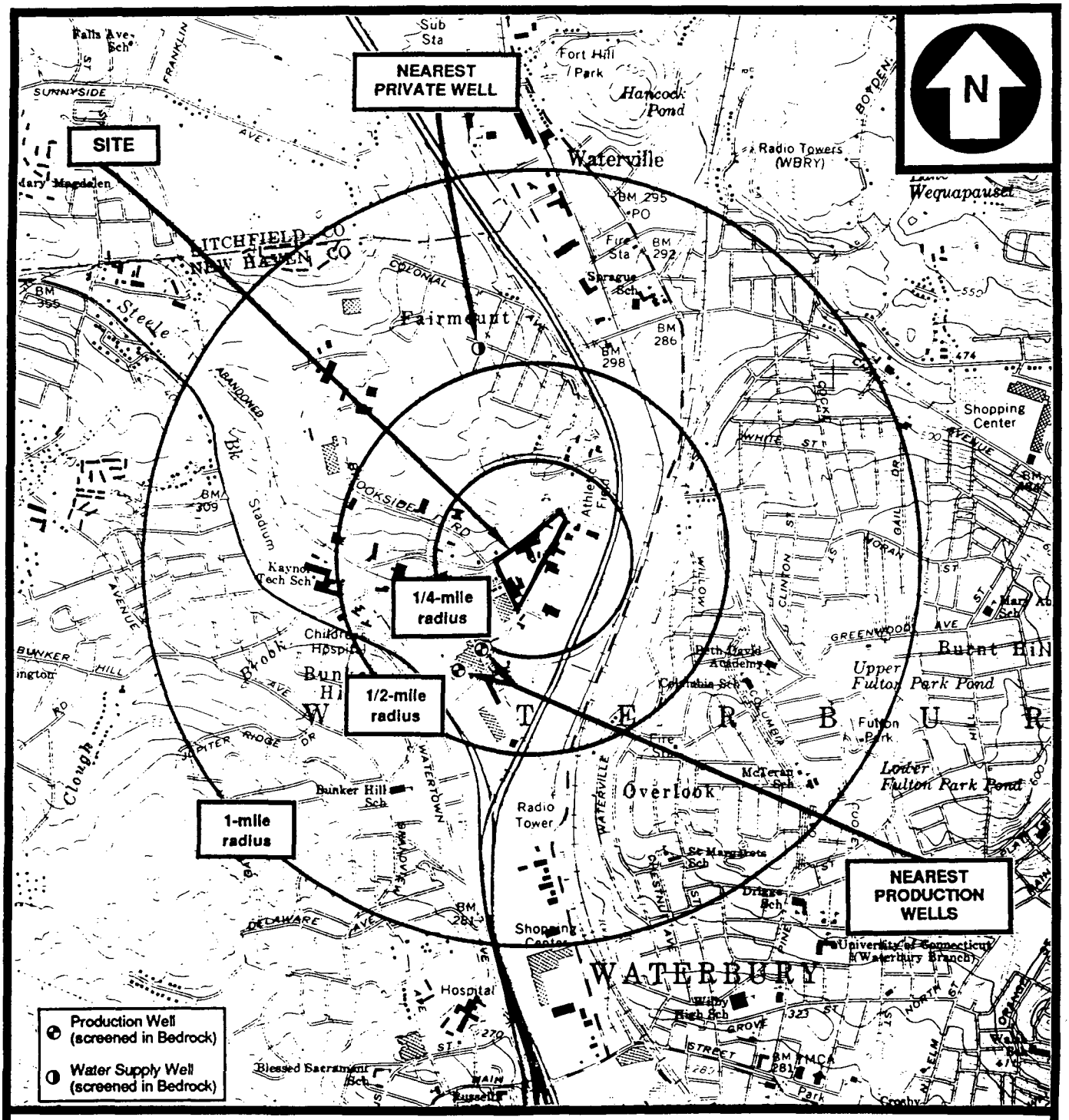
This Environmental Indicators Review (EIR), has been prepared using currently available information. Any assessment or conclusions included in this report reflect present conditions at the site, which might change in the future. There are two MacDermid facilities located in Waterbury. The subject of this EIR is the Huntingdon Avenue facility which has been ranked "high" on the National Corrective Action Priority System by EPA.

I.1. FACILITY INFORMATION

MacDermid has been in operation at the Huntingdon Avenue location since 1930. From 1916 to 1928 the property was occupied by the Waterbury Steel Ball Company. Before 1916, the property was owned by the Metal Specialty Company. The Waterbury Steel Ball Company leased the property to MacDermid until 1950, when MacDermid purchased the property. The facility is located at 526 Huntingdon Ave. in Waterbury. The main part of the facility encompasses a city block between Huntingdon Ave., East Aurora St., and Gear St., on approximately 11 acres of land.

The MacDermid facility specializes in the blending of inks, formulating of chemical products used for metal finishing, plating on plastics, electronics, microelectronic and surface treatment applications. In addition the facility accepts spent products, such as copper etchant and solder stripper, from customers and off-site MacDermid facilities for recycling at this site. A wide variety of chemicals are used and produced at the MacDermid facility.

The land in the vicinity of MacDermid is a mix of industrial, residential, and commercial areas. MacDermid is bordered by residences to the west, by four small businesses (Ryder Rent-a-Truck, Paint Specialty-Auto Body, Insurance Claim Service and Sullivan Cable) to the south, by an auto-body shop (Tuttle Auto Body to the east, and by 42 acres of property owned by MacDermid to the north.



BASE MAP IS A PORTION OF THE FOLLOWING USGS 7.5' SERIES QUADRANGLE: WATERBURY, CT, 1968, PHOTOREVISED 1984

0 1000 2000 3000

SCALE = feet

CONN

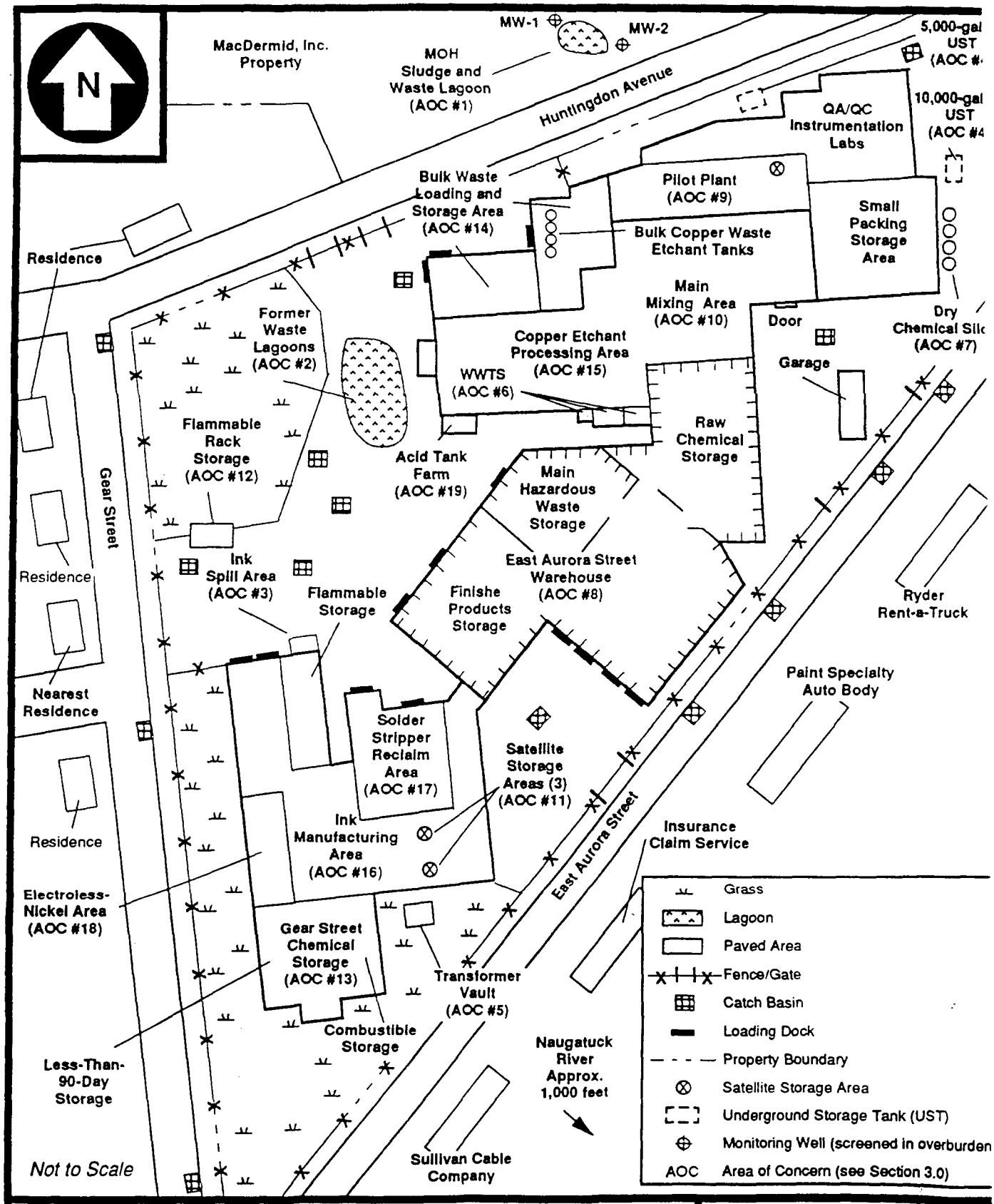
QUADRANGLE LOCATION

LOCATION MAP

MACDERMID, INC.- HUNTINGDON AVE. FACILITY
WATERBURY, CONNECTICUT

TRC

Figure 1.



SITE SKETCH

MACDERMID, INC.
WATERBURY, CONNECTICUT

TRC

Figure 2.

MS70:1:N

TABLE 4. PUBLIC WATER SUPPLIES LOCATED WITHIN A FOUR-MILE RADIUS OF MACDERMID, INCORPORATED, HUNTINGDON AVENUE FACILITY, WATERBURY, CONNECTICUT

Distance Ring	Source Name	Source Type	Distance/ Direction from Site	Location	Population Served
2.0 - 3.0 miles	Arrowhead-by-the-Lake	Two bedrock wells, 250 feet deep	2.6 miles northeast	Wolcott, Connecticut	123
	Lake Hills Village	Bedrock well, 200 feet deep	2.9 miles northeast	Wolcott, Connecticut	132
Subtotal					**255**
3.0 - 4.0 miles	Hillcrest Fire District	Bedrock well, depth unknown	3.1 miles southwest	Middlebury, Connecticut	150
TOTAL					**405**

(CTDOH, 1991; Gabis (TRC), 1993b)

There are 1.4 miles of vegetated wetland frontage along the 15-mile length of the Naugatuck River. These wetlands consist of palustrine, emergent, saturated and semipermanent, forests and shrub-scrub environments. There are approximately 720 acres of vegetated wetlands located within a four-mile radius of MacDermid. The facility abuts Steele Brook which discharges into the Naugatuck River.

There are threatened and endangered species located within a four-mile radius of MacDermid Inc. at the Huntingdon Ave. facility in Waterbury. The variable sedge (carex polymorpha), is an endangered species found in a 2 to 3 mile distance from the site. The hairy woodmint (blephilia hirsuta), is classified as a species of special concern and is found 3 to 4 miles from the facility. The great laurel (rhododendron maximum), is found 2 to 3 miles from the site. In addition plant and animal species living in the waters of Steele Brook and the Naugatuck River are at risk, whenever there is an illegal discharge from the facility.

The facility holds an NPDES permit for their treated effluent from a wastewater treatment plant and a permit for their stormwater discharge.

II SITE ASSESSMENT

There are 19 Areas of Concern (AOC's) as shown on the enclosed Fig. 2 and they are listed below:

AOC #1 [a,b] Metal Hydroxide Sludge and Waste Lagoon located north of Huntingdon Ave.

AOC #2[a,b,c] Former Waste Lagoons, located southwest of Huntingdon Ave.

AOC #3[a,b] Ink Spill Area, 550 cu.ft. of contaminated soil are buried under a concrete pad adjacent to the Gear Street building.

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AOC#4[d] Two underground storage tanks (UST). One 5,000 gallon heating oil UST located on the north side of Huntingdon Ave. building, and one 10,000 gallon diesel UST, empty, next to the dry chemical silos, on east of Huntingdon Ave. building.

AOC#5[d] Transformer Vault. One steel vault 4'x4'x4', located on a concrete pad, next to Gear St. building, facing East Aurora St.

AOC#6[c] Wastewater Treatment System (WWTS). This system consists of 13 treatment tanks, a 15 cu. yd. filter press and 26 cu. yd. metal hydroxide sludge roll-off. The system discharges into the municipal sewer system, which leads to the Waterbury sewage treatment plant with outlet into the Naugatuck River. MacDermid has exceeded their NPDES permit allowed concentrations many times. MacDermid has exceeded their permit allowed limits on many occasions.

AOC#7[d] Four Dry Chemical Silos. These 10,000 gallon steel silos are currently empty, and they will soon be removed off the property.

AOC#8[d] East Aurora St. Warehouse. This warehouse contains the main hazardous waste storage area, the spot-check QA/QC areas and the finished products area.

AOC#9[d] Pilot Plant. This area includes QA/QC Labs with 100-200 gallon test samples and a small packaging area in addition to the Pilot Plant. The Pilot Plant and the packaging area have floor drains leading to the WWTS. The QA/QC Labs are contained within epoxy-coated concrete floor rooms.

AOC#10[d] Main "Mixing" Area, located in the center of Huntingdon Ave. building. This used to be the main dry chemical production area. Prior to that, it was formerly used for liquid mixing of copper plating solutions from raw chemicals. At present it is only used for repackaging of drums for shipment. The entire area has epoxy coated concrete floors and the floor drains lead to the WWTS.

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AOC#11[d] Three Satellite Storage Areas. One of the areas is located in the Pilot Plant area and two of them are in the ink manufacturing/Gear St. building. Each area stores either one or two 55-gallon drums on epoxy coated concrete floor with a 3.5 inch epoxy-coated angle-iron berm.

AOC#12[e] Flammable Rack Storage. A four-tier drum rack storage, located outside on a roofed, concrete pad and provided with fiberglass walls on three sides.

AOC#13[d] Three Chemical Storage Areas at Gear St. All areas have drums stored on epoxy-coated concrete floor with angle-iron berm and concrete berm. All floor drains are connected to the WWTS.

AOC#14[c] Bulk Waste Loading and Storage Area. This area consists of four storage tanks (three 8,000, one 5,000 gallon) with copper etchant and recycling wastes; a spent copper etchant loading/unloading dock and a drum washing area on the loading dock. The tanks have two-foot-seven-inch concrete berm on an epoxy coated concrete floor. The loading dock slopes to floor drains leading to the WWTS.

AOC#15[c] Copper Etchant Processing Area in Huntingdon Ave. building. This processing area includes a 13-tank recycling system connected to three 6,300 gl product storage tanks. The area floors are epoxy-coated and floor drains lead to the WWTS.

AOC#16[d] Manufacturing Area in Gear St. Building. There are 3 roller mills for pressing powders which are mixed with solvents in 140 gl. fiber-reinforced plastic vats. All wastes are stored in 55-gallon drums in the satellite storage area and in the combustible storage area.

AOC#17[d] "Solder Stripper Reclaim Area" in Gear Street Building. This area has three tanks with a 5,000 gallon total capacity that used to process 1,300 gallons per batch of lead solder stripper. Area floors are epoxy-coated and floor drains lead to the WWTS. The tanks are not used anymore and soon will be removed off site.

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AOC#18[d] Electroless Nickel Area in Gear Street Building. There are eight 1,200-gallon tanks processing 3,000 gallons per week. Wastes are directed to the filtering area and to the WWTP. The area has a wet scrubber for ammonia, an epoxy-coated concrete floor, and a foot trench leading to the WWTP.

AOC#19[d] Acid Tank Farm. This area is located outside, on the southwest corner of the Huntingdon Ave. building. This area consists of five 3,000-gallon tanks on asphalt with a 2-3 ft concrete berm and a fence.

AOC#20[c] Indoor Floor Drains and Outdoor Catch Basins. There is a potential for release of hazardous constituents, from cracks in the drainage system, that may have leaked over years of operation of the facility.

AOC#21[e] Sewer Pipelines (NPDES and stormwaters), and Sewer discharge points into Steele Brook and the Naugutuck River. The potential releases are directly associated with the documented past releases by bypassing, mismanaging, or deficient performance of the WWTS.

AOC#22[e] Ammonia, hydrochloric acid, phosphoric acid and any other gaseous generating processes throughout the plant.

a - Release(s) to soils have occurred from the operations of the AOC.

b - Release(s) to groundwater at the vicinity of the site have occurred which are associated with the operations of the AOC.

c - Release(s) to surface water have occurred which are a result of the operations of the AOC.

d - A low potential for a release to the environment exist at this AOC.

e - Release(s) to air have occurred from the operations of the AOC.

e - A high potential for a release exists at this AOC, however none has been documented.

Documented releases from the listed AOC's and remedial interim measures taken are as follows:

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1- AOC#1, Hazardous Waste Pile. The metal hydroxide along with other unspecified waste from the lagoons was excavated and deposited, without a liner into this waste pile area, in 1978, before RCRA became effective in 1980. There is not enough available data on the release, but it is reasonable to assume that in more than 10 years that the pile remained in an unlined area, the groundwater has been contaminated with hazardous constituents. The waste was removed and shipped off-site. There is conflicting information regarding whether the waste went to the Archer Landfill or whether it went to STABLEX in Canada. There is conflicting information regarding whether the waste was shipped off-site in the late 80's or the early 90's. There is no evidence of any confirmatory sampling, to demonstrate the removal was done to meet health or risk-based standards. The waste pile area has been paved over.

2- AOC#2, Two Hazardous Waste Lagoons. The lagoons operated from 1930 to 1978 and contained inorganic (metal hydroxide), and organic wastes. Groundwater monitoring data of samples taken from wells at the former lagoons site, on October 1, 1992, show that only seven constituents of concern were monitored, and that chromium, copper and nickel concentrations were as high as 6,400 ppb, 350,000 ppb, and 4,100 ppb. The Connecticut Remediation Standard Regulations (RSR's), establish the corresponding standards for surface water protection at 110 ppb, 48 ppb and 880 ppb. The RSR's for groundwater protection at a GA area for copper is 1,300 ppb, for nickel is 100 ppb and for chromium is 50 ppb.

3- AOC#3, Ink Spill Area. Up to 62,970 ppb of toluene, 70 ppb of 1,1,1-trichloroethane, and 2,910 ppb of ethylbenze were detected in the soils. Potentially this spill also may have impacted the groundwater.

4- AOC#6, Wastewater Treatment System (WWTS). The WWTS operations have apparently leaked on several occasions, two of which were documented in the 90's. On January 28, 1991, a spill of 7,000 gallons from a WWTS holding tank was discharged into the Naugatuck River. There is no readily available information at the CTDEP files concerning this spill.

In November 1994, a spill of 1,500 gallons of a highly toxic mix of copper etchant solution, was discharged into the Naugutuck River killing approximately 12,000 fish on the day of the spill.

5- AOC#14, Bulk Waste Loading and Storage Area. Drums containing spent copper etchant were washed at the loading dock, the washwater run off went across the paved area into a catch basin connected to the storm drain system, which discharged into Steele Brook. The WWTS was bypassed. Grab samples of the discharge showed copper at 320 mg/l and lead at 5.6 mg/l.

6- AOC #21, Sewer lines and Sewer Outfalls. There is documentation of chemical spills into Steele Brook and into the Naugatuck River via the storm sewer or WWTS sewer.

7- AOC #22, Gaseous Generating Processes. In June 26, 1990, there was a process scrubber failure which resulted in a release of hydrochloric and phosphoric acid vapors/mists into the atmosphere. Neighbors complained about eye and respiratory system irritation, which required the evacuation of part of the neighborhood. Subsequently, on July 26, 1990 ammonia fumes and a vapor cloud were released from MacDermid.

III CORRECTIVE MEASURES

The following are the interim corrective measures that MacDermid has taken at their AOC's:

1- Concerning AOC#1, the waste pile, in the late 1980's, according to interviews with MacDermid personnel on a site visit on 7/17/98, the waste from the waste pile was removed and shipped off-site to a permitted facility in Canada, (STABLEX). Conflicting information at the CTDEP files indicate the waste was shipped to the Archer Landfill. MacDermid has no records of any soil sampling performed at the bottom and sides of the excavation and therefore some residual contamination may still be present.

2- Regarding AOC#6, the operations at the WWTS have improved. As of May 1998, four new effluent holding tanks with a capacity of 15,000 gallons each, have been installed. In addition these tanks have been provided with secondary containment (berm of approx. 3 feet height).

3- AOC#22, air releases into the neighborhood have stopped by using the proper equipment and maintenance procedures.

IV ENVIRONMENTAL INDICATORS

A) HUMAN EXPOSURES CONTROLLED (CA725)

Based upon the review of the environmental monitoring data, site operations and the facility environmental setting, it is suggested that MacDermid, Huntingdon Ave. site in Waterbury, cannot be classified as a site where human exposures are controlled (YE determination), or where no control measures are necessary (NC determination).

Based upon guidance specified in the July 24, 1994, U.S. EPA "RCRIS Corrective Action Environmental Indicator Event Codes" memorandum, one of the two criteria must be met for a YE determination. These are:

1- Remedial measures have been implemented with the result that all maximum contaminants detected or reasonably suspected (e.g., MCL's for groundwater, a 10^{-6} risk level for other contaminants, or any other number designated as the action level), or do not exceed an Agency specified cleanup standard for the facility and/or,

2- There is no unacceptable human exposure to any contaminant concentration above action levels that had been detected or is reasonable suspected, based on current contaminant concentrations and the current site conditions.

MacDermid at Huntingdon in Waterbury cannot meet a YE determination for code CA725, because there exists the potential of direct exposure from contaminated sediments at the outfall of the sewers discharging into Steele Brook located less than 1,000 feet from the WWTS.

There is no available data to prove the site is clean and on the contrary, there have been repeated chemical spills from MacDermid that have been known to affect the fish and other aquatic life in Steele Brook and on a 15-mile or longer stretch of the Naugatuck River.

B) GROUNDWATER RELEASES CONTROLLED (CA750)

Based upon guidance specified in the July 29, 1994 U.S. EPA "RCRIS Corrective Action Environmental Indicator Event Codes" memorandum, one of two criteria must be met for a YE determination for the CA750 code. These are:

1- An engineered system has been installed that is designed and operating (including performance monitoring), to effectively control the further migration beyond a designated boundary, a line upgradient of receptors, or the leading edge of the plume as defined by levels above the Agency established action levels or clean-up standards, or

2- The Agency has determined that the groundwater cleanup objectives can be met without the use of an engineered system through the remedial measures selected, including facilities where the contamination will naturally attenuate.

MacDermid at Huntingdon Ave. cannot meet the CA750 code, because there is the potential for groundwater contamination from leaching of contaminants from residual contaminated soils at the former site of the lagoons and waste pile, as well as from other sources that have not been identified or investigated, such as for example, the subsoils at the drainage system which collects chemical spills from the factory and directs them to the WWTS.

V- RECOMMENDED ACTIONS

A- The following actions are recommended to achieve a YE determination for the event code CA725:

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1- Investigate the extent and degree of sediment contamination caused by repeated spills from MacDermid, at the outfall(s) of the sewer discharges at Steele Brook, and implement remedial actions if necessary.

B- The following actions are recommended to achieve a YE determination for the event code CA750:

1- Install a groundwater monitoring system which would define the extent and degree of groundwater contamination at the site.

2- Install an engineered control system which would be designed to intercept the plumes of contamination and treat the contaminants within the property boundaries of MacDermid.

3- Assess the integrity of the indoor floor drains and the outdoor catch basins and their associated pipelines, vis-a-vis the potential for leaks that result in contaminated soils that may impact the quality of the groundwater; and implement remedial actions if necessary.

4- Investigate the old pipelines that bypass the WWTS, the use of which have caused releases into the environment, and close them to CTDEP and federal standards.

VI- BIBLIOGRAPHY

1- FINAL RCRA FACILITY ASSESSMENT MACDERMID, INCORPORATED, RCRA FACILITY ASSESSMENTS - TRC ENVIRONMENTAL CORPORATION - SEPTEMBER 24, 1993

2- CTDEP (HAZARDOUS WASTE), WASTE ENGINEERING AND ENFORCEMENT DIVISION ENFORCEMENT FILES.

3- INTERVIEWS WITH MACDERMID PERSONNEL - JULY 17, 1998 - AT SITE

4- CTDEP (HAZARDOUS WASTE), WASTE ENGINEERING AND ENFORCEMENT DIVISION INSPECTION FILES.

5- CTDEP (WATER), PERMIT, ENGINEERING AND REMEDIATION DIVISION, INSPECTION AND ENFORCEMENT FILES.

6- CTDEP CONFIDENTIAL ENFORCEMENT AND PERMIT FILES.